

REMARKS:

Reconsideration of the subject application in light of the following remarks is respectfully requested. Claims 1-58 are pending. Claims 18-58 have been withdrawn pursuant to 35 U.S.C. §121, leaving Claims 1-17. No claims have been amended. No new claims have been added.

Claim Rejections Under 35 USC §112, Second Paragraph

Claims 1, 3, 6-11, and 15-17 have been rejected under 35 USC §112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as their invention. In particular, the term “at least some of” in Claim 1 is alleged a relative term which renders the claim indefinite.

The term “at least some” is not a relative term in that Applicants’ presently claimed invention need merely comprise more than zero to satisfy the recited claim limitation. Furthermore, the term “at least two” has been held acceptable (see *Lantech Inc. v. Keip Machine Co.*, 31 PQ2d 1666), which is nearly identical to at least some (e.g., more than zero) of the recited capping agent does not form a support bound activator. Accordingly, Applicants presently claimed invention particularly points out and distinctly claims the subject matter which Applicants regard as their invention such that the scope of the claimed subject matter can be determined by one having ordinary skill in the art.

Claims 3 and 6-8 are alleged to fail to disclose a lower limit of Si-OH functional groups and the term “about” is alleged to render the claims indefinite because Examiner alleges “about” could mean an amount above that claimed rather than “less than or equal to” which precedes it. The term “about” is also alleged vague in terms of the recited temperature variance.

In Claims 3 and 6-8, Applicants recite a catalyst support which comprises hydroxyl groups. The lower limit is thus satisfied by the presence thereof. A lower limit is not required to particularly point out and distinctly claim Applicants presently claimed invention to one of ordinary skill in the art.

The term “about” has long been held acceptable (see *Ex parte Eastwood et al.*, 163 USPQ 316, *W. L. Gore & Assoc. Inc. v. Garlock Incl.*, 220 USPQ 303, see also MPEP §2173.05 (b)). In addition, MPEP §2173.02 Clarity and Precision, states that the claims should define the patentable subject matter with a reasonable degree of particularity and distinctness. The limitations are directed to determining temperature and the concentration of

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Si-OH functional groups per gram support. Both of these parameters are readily determined within reasonable certainty by one of ordinary skill in the art. Accordingly, claims 3 and 6-8 define Applicants' presently claimed invention with a reasonable degree of particularity and distinctness.

Claim 9 is alleged vague and indefinite because it is alleged unclear from the specification or claims what would comprise the "inner surface" or "outer surface" of the particle. Examiner also questions what the concentrations of the inner to outer surface would be. Examiner states that there are no definitive amounts or ratios given and it is unclear how one of ordinary skill in the art would be able to ascertain the difference between the "inner" OH groups and the "outer" OH groups.

In Claim 9, Applicants recite each particle having a plurality of pores arranged within the particle such that a surface of the pores (arranged within the particle) defines an inner surface of the particle. Applicants further recite the inner surface of the particle is located internal to an outer surface of the particle. Accordingly, the relative locations of both the inner surface and the outer surface of the particle are described with a reasonable degree of particularity and distinctness using general terms whose definitions are readily understood by one of ordinary skill in the art. Applicants also recite the limitation that the concentration of Si-OH functional groups on the inner surface is greater than the concentration of Si-OH functional groups disposed on the outer surface. Accordingly, the ratio of the two types of Si-OH functional groups is recited. Further, the Examiner's attention is directed to pages 17 and 18 of the application as filed, where Applicants disclose numerous methods by which the relative concentrations of the "inside" verses the "outside" Si-OH groups may be determined. Claim 9 thus comports with the requirements of 35 USC §112, second paragraph.

Claims 10, 11, 15, and 16 are alleged to recite an improper Markush group. Claim 10 recites a catalyst support "wherein the capping agent comprises R^1R^2BH , and wherein R^1 and R^2 are independently at each occurrence an organic radical comprising: C_1 - C_{40} -alkyl, C_1 - C_{40} -haloalkyl, C_6 - C_{40} -aryl, C_6 - C_{40} -haloaryl, C_7 - C_{40} -arylalkyl, C_7 - C_{40} -halo-arylalkyl, or a combination comprising at least one of the foregoing." Claim 10 is open ended and thus does not recite a Markush group.

Claim 11 further defines R^1 and R^2 of Claim 10, referring to the R groups in the alternative as comprising particular functional groups. Like Claim 10, Claim 11 is open ended and does not recite a Markush group.

Claims 15 and 16 further limit Applicants presently claimed invention to comprise particular ionic activators. Like Claims 10 and 11, Claims 15 and 16 are open ended and do not recite a Markush group. Accordingly, the rejection of Claim 10, 11, 15 and 16 under 35 USC §112, second paragraph is improper. Applicants respectfully request the rejections be withdrawn.

Claim 17 is alleged to have an improper transitional phrase "wherein". Claim 17 depends from Claim 1. Claim 17 further limits Claim 1 from comprising a catalyst support, wherein at least some of the capping agent does not form a support bound activator (Claim 1), to a catalyst support wherein essentially all of the capping agent does not form a support bound activator (Claim 17.)

MPEP § 2111.03 Transitional Phrases states that if the applicant contends that additional steps or materials in the prior art are excluded by the recitation of "consisting essentially of," applicant has the burden of showing that the introduction of additional steps or components would materially change the characteristics of applicant's invention. *In re De Lajarte*, 337 F.2d 870, 143 USPQ 256 (CCPA 1964). However, Applicants do not contend that additional steps or materials in the prior art are excluded by the recitation of "consisting essentially of", but merely further limit Applicants' presently claimed invention to a preferred embodiment. Accordingly, Applicants are under no duty to provide a showing that the introduction of additional steps or components materially change the characteristics of Applicants' invention. Examiners attention is respectfully directed to MPEP § 2111.03, *Ex parte Hoffman*, 12 USPQ2d 1061, 1063-64 (Bd. Pat. App. & Inter. 1989) ("Although 'consisting essentially of' is typically used and defined in the context of compositions of matter, we find nothing intrinsically wrong with the use of such language as a modifier of method steps. . . [rendering] the claim open only for the inclusion of steps which do not materially affect the basic and novel characteristics of the claimed method. To determine the steps included versus excluded the claim must be read in light of the specification." Accordingly, Applicants recited compositional limitation is akin to the method steps of *Ex parte Hoffman*, which allow for Applicants' presently claimed invention to be limited regarding this particular limitation, yet remain open to limitations which do not materially affect the basic and novel characteristics of Applicants' presently claimed invention.

Removal of the rejections under 35 USC §112, second paragraph are respectfully requested.

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Claim Rejections Under 35 USC §102

Claims 1-8 and 10-15 have been rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,885,924 to Ward (hereinafter Ward.)

To anticipate a claim under 35 U.S.C. §102, a single source must contain all of the elements of the claim. *Lewmar Marine Inc. v. Barient, Inc.*, 827 F.2d 744, 747, 3 U.S.P.Q.2d 1766, 1768 (Fed. Cir. 1987), *cert. denied*, 484 U.S. 1007 (1988). The test for anticipation is symmetrical to the test for infringement and has been stated as: "That which would literally infringe [a claim] if later in time anticipates if earlier than the date of invention." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989); *Connell v. Sears Roebuck & Co.*, 722 F.2d 1542, 1548, 220 U.S.P.Q. 1931, 1938 (Fed. Cir. 1983). Moreover, the single source must disclose all of the claimed elements "arranged as in the claim." *Structural Rubber Prods. Co. v. Park Rubber Co.*, 749 F.2d 707, 716, 223 U.S.P.Q. 1264, 1271 (Fed. Cir. 1984). Missing elements may not be supplied by the knowledge of one skilled in the art or the disclosure of another reference. *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 780, 227 U.S.P.Q. 773, 777 (Fed. Cir. 1985).

In Claim 1, from which Claims 2-17 depend, Applicants recite a catalyst support comprising the result of the combination of a support comprising hydroxyl groups; ...a capping agent comprising a boron containing Lewis acid;...wherein at least some of the capping agent does not form a support bound activator.

Ward is directed to supported catalytic activators. In particular, Ward is directed to reacting a carrier containing reactive functionalities with halogenated organic compounds, e.g., fluorosubstituted phenols in the presence of a base. The reaction consumes undesired functionalities on the support to provide a halogenated support suitable for activators and catalytic precursors adversely affected by functionalities typically found on supports. The supported activators or catalytic precursors disclosed by Ward are prepared by contacting the precursors or activators with the halogenated support (see Abstract.)

Examiner notes that Ward discloses inorganic oxide carriers, calcinations of the support, a fluoride salt, and a range of -OH groups per gram of support less than about 10 mmol per gram of support. Examiner also notes that at Col. 5, line 62, Ward discloses perfluorophenylboron, and at Col. 5, lines 9-67, Ward discloses an ammonium cation to the borate anion.

Ward discloses "support particles characterized by the presence of halogenated organic groups on the particle surface represented by the formula Carrier-L-RX;; and further

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a supported catalytic activator represented by the formula Carrier-L-Rx::[Compound A] and supported catalyst systems by placing transition metal catalysts on the support...or the supported catalytic activator..." (Col. 3, lines 35-42.) According to Ward, "L" is a "Linker", representing a linkage resulting from the reaction of the support with a base, that would be present on the support and capable of forming a covalent bond to the halogenated organic RX (see Col. 4, lines 31-37, emphasis added.) RX is any halogenated organic where X is a halogen group element (see Col. 4, lines 51-52.)

However, Col. 5, lines 9-67, wherein perfluorophenylboron and an ammonium cation to the borate anion are disclosed, are directed to the above labeled, [Compound A], which Ward defines as "a compound capable of forming an ionic complex when reacted with a transition metal catalytic precursor" (Col. 5, lines 9-11.) Compound A is referred to by Applicants as a support bound activator (SBA), which Applicants differentiate from their recited capping agent comprising a boron containing Lewis acid. In fact, Compound A is consistent with the ionic activator recited by Applicants in Claim 1.

As indicated above, Ward discloses a linkage resulting from reaction of the support with a halogenated organic in the presence of a base. Typical base reactants disclosed by Ward include metal hydroxides such as NaOH or KOH, various amines, alkyl lithium, and alkyl magnesium compounds. Ward fails to disclose the contact product of a support comprising hydroxyl groups with a capping agent comprising a boron containing Lewis acid. In fact, Ward specifically requires the support be contacted with a halogenated alkyl in the presence of a base. According to the teachings of Ward, the reaction of Applicants recited boron containing Lewis acid in the presence of a base would not result in Applicants recited catalyst support, but would instead result in a salt comprising the Lewis acid and the base. Ward fails to disclose all of the claimed elements arranged as in the claim, and is instead directed to conditions which would not only fail to result in Applicants' recited catalyst support, but would render Applicants' presently claimed invention inoperative. Ward cannot reasonably be found to anticipate Applicants' presently claimed invention. Removal of the rejection is respectfully requested.

Claims 1-5, 9, and 12-15 have been rejected as being anticipated under 35 U.S.C. §102(b) by U.S. Patent No. 6,265,505 to McConville et al. (hereinafter McConville.)

McConville is directed to a Group 15 containing metal catalyst compound and a Lewis acid aluminum containing activator and to a supported catalyst system thereof...(see

Abstract.) Examiner alleges McConville discloses Applicants' presently claimed invention between Col. 5, line 52 and Col. 9, line 53.

McConville clearly discloses "[t]he Lewis acid compounds of the invention include those **olefin catalyst activator Lewis acids** based on aluminum and having at least one bulky, electron-withdrawing ancillary ligand such as the halogenated aryl ligands of tris(perfluorophenyl)borane or tris(perfluoronaphthyl)borane. These bulky ancillary ligands are those sufficient to allow the Lewis acids to function as **electronically stabilizing, compatible non-coordinating anions**. Stable ionic complexes are achieved when the anions will not be a suitable ligand donor to the strongly Lewis acidic cationic Group 15 containing transition metal cations used in insertion polymerization..." (Col. 5, line 63 to Col. 6, line 10, emphasis added.) McConville then discloses the Lewis acid aluminum containing activator may be combined with one or more support materials such that "the **Lewis acid activator** is in supported form..." (Col. 7, lines 1-9, emphasis added.)

In terms of "capping agents", McConville discloses that "[t]he tailoring of hydroxyl groups available as attachment sites can also be accomplished by the pre-treatment, prior to addition of the Lewis acid, with a less than stoichiometric amount of the chemical dehydrating agents. Preferably those used will be used sparingly and will be those having a single ligand reactive with the silanol groups (e.g., $(\text{CH}_3)_3\text{SiCl}$), or otherwise hydrolyzable, so as to minimize interference with the reaction of the transition metal catalyst compounds with the bound activator. If calcining temperatures below 400°C are employed, difunctional coupling agents (e.g., $(\text{CH}_3)_2\text{SiCl}_2$) may be employed to cap hydrogen bonded pairs of silanol groups which are present under the less severe calcining conditions. ...Similarly, use of the Lewis acid in excess of the stoichiometric amount needed for reaction with the transition metal compounds will serve to neutralize excess silanol groups without significant detrimental effect for catalyst preparation or subsequent polymerization." (Col. 7, line 62 to Col. 8, line 18.)

McConville fails to disclose Applicants recited catalyst support comprising the combination of a support comprising hydroxyl groups, a capping agents comprising a boron containing Lewis acid and an ionic activator, wherein at least some of the capping agent does not form a support bound activator. Instead, McConville is directed to Lewis acids which form support bound activators. As such, McConville fails to disclose all of the claimed elements arranged as in the claim. McConville cannot reasonably be found to anticipate Applicants' presently claimed invention.

Claims 1-7 and 10-15 are rejected as being anticipated under 35 U.S.C. §102(b) by U.S. Patent No. 6,524,988 to Specac (hereinafter Specac-988.). Examiner alleges the entire document of Specac-988 to disclose Applicants' presently claimed invention.

Specac-988 is directed to catalyst compositions containing at least one metallocene, and at least one activator and a support that has been fluorinated using a fluoride containing compound. Specac-988 discloses using non-coordinating anion activators with the discloses support, which are sufficiently strong Lewis acids to react with hydroxyl reactive functionalities present on the silica surface such that the Lewis acid becomes covalently bound (to the support.) In other words, Specac-988 discloses support bound activators.

Specac-988 fails to disclose a capping agent, much less a capping agent comprising a boron containing Lewis acid, wherein at least some of the capping agent does not form a support bound activator. Since Specac-988 fails to disclose all of Applicants' recited limitations, Specac-988 cannot reasonably be found to anticipate Applicants' presently claimed invention.

Claim Rejections Under Nonstatutory Double Patenting

Claims 1-7 and 10-15 have been rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-17 of U.S. Patent No. 6,524,988 (Specac-988), and claims 1-8 of U.S. Patent No. 6,667,272 to Specac (hereinafter Specac-272.) Examiner admits the claims are not identical, however, Examiner alleges Applicants' presently claimed invention to be a genus of the patented claims.

Specac-988, as discussed above, fails to disclose a capping agent, much less Applicants' recited catalyst support comprising the result of the combination of a support comprising hydroxyl groups, a capping agent comprising a boron containing Lewis acid; and an ionic activator, wherein at least some of the capping agent does not form a support bound activator. Accordingly, Applicants' presently claimed invention cannot reasonably be found to be a genus of the species disclosed by Specac-988.

Specac-272 is a divisional of Specac-988. Claims 1-8 of Specac-272 recite a support comprising a fluorided support and a non-coordinating anion bound to the fluorided support, wherein the non-coordinating anion is selected from the group consisting of highly fluorinated tris-arylborane compounds and mixtures thereof. Since the specification of Specac-272 is identical to Specac-988, the reference so too fails to disclose a capping agent, much less Applicants' recited catalyst support.

Accordingly, neither Spec-a-988 nor Spec-a-272 disclose a genus of Applicants' presently claimed invention. A rejection of the claims under the judicially created doctrine of obviousness-type double patenting based on either reference is therefore improper.

Applicants respectfully request the rejection be withdrawn.

Respectfully submitted,

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